

**[12] Patent Application Publication of Invention**

[21] Application No. 200410077725.7

A01N 47/44

[43] Publication Date 2005.08.03

[11] Publication No. CN 1647643 A

[22] Application Date 2004.12.29

[74] Patent Agency Guangzhou Yuegao

[21] Application No. 200410077725.7

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Taicheng Disinfectant

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Claims: 1 page, Description: 5 pages.

**[54] Title A disinfectant****[57] Abstract**

The invention discloses a disinfectant, which is composed of (by weight percent) polyethoxyl carboxyl carbamidine 0.1-2.0 %, dodecyl dimethyl benzyl ammonium chloride 0.1-2.0%, dodecyl dimethyl benzyl ammonium bromide 0.1-2.0%, bisoctyl/bisdecyl dimethyl ammonium chloride 0.1-2.0%, tetradecyl/octadecyl dimethyl benzyl ammonium chloride 0.1-2.0%, 2-bromo-2-nitro-1,3-propylene glycol 0.1-2.0% and water in balance. The inventive disinfectant is a non-corrosive transparent single-component liquid, which is colorless, odorless, nontoxic and

harmless, and has the advantages of small dosage, good disinfecting effect, high safety and good environmental friendliness.

**What is claimed is:**

1. A disinfectant, which is characterized in that it is composed of (by weight percent)

polyethoxyl carboxyl carbamidine 0.1-2.0%

dodecyl dimethyl benzyl ammonium chloride 0.1-2.0%

dodecyl dimethyl benzyl ammonium bromide 0.1-2.0%

bisoctyl/bisdecyl dimethyl ammonium chloride 0.1-2.0%

tetradecyl/octadecyl dimethyl benzyl ammonium chloride 0.1-2.0%

2-bromo-2-nitro-1,3-propylene glycol 0.1-2.0%

and water in balance.

2. The disinfectant according to claim 1, which is characterized in that it is composed of (by weight percent)

polyethoxyl carboxyl carbamidine 0.2-0.5%

dodecyl dimethyl benzyl ammonium chloride 0.2-0.5%

dodecyl dimethyl benzyl ammonium bromide 0.2-0.5%

bisoctyl/bisdecyl dimethyl ammonium chloride 0.2-0.5%

tetradecyl/octadecyl dimethyl benzyl ammonium chloride 0.2-0.5%

2-bromo-2-nitro-1,3-propylene glycol 0.2-0.5%

and water in balance.

## **Description**

A disinfectant

## **Field of the Invention**

This invention relates to the field of compositions, particularly to a disinfectant.

## **Background of the Invention**

Disinfectants are often involved in industrial production and daily life. Most of the existing disinfectants are composed of various micro-toxic or toxic chemical compositions, in which there are certain risks and safety hazards to the human body. Safety and environmental protection issues of disinfectants have always been the topics focused by the science and technology sector, and people expect the appearance of a disinfectant which is colorless, odorless, non-irritating, nontoxic, harmless, efficient, broad-spectrum, safe, effective and environmentally-friendly.

## **Content of the Invention**

The purpose of this invention is to provide a safe, effective and environmentally-friendly disinfectant, aiming to overcome various disadvantages of existing disinfectants.

The disinfectant of the present invention is composed of (by weight percent)

polyethoxyl carboxyl carbamidine 0.1-2.0%,

dodecyl dimethyl benzyl ammonium chloride 0.1-2.0%,  
dodecyl dimethyl benzyl ammonium bromide 0.1-2.0%,  
bisoctyl/bisdecyl dimethyl ammonium chloride 0.1-2.0%,  
tetradecyl/octadecyl dimethyl benzyl ammonium chloride 0.1-2.0%,  
2-bromo-2-nitro-1,3-propylene glycol 0.1-2.0%,  
and water in balance.

Preferably, the disinfectant is composed of (by weight percent)  
polyethoxyl carboxyl carbamidine 0.2-0.5%,  
dodecyl dimethyl benzyl ammonium chloride 0.2-0.5%,  
dodecyl dimethyl benzyl ammonium bromide 0.2-0.5%,  
bisoctyl/bisdecyl dimethyl ammonium chloride 0.2-0.5%,  
tetradecyl/octadecyl dimethyl benzyl ammonium chloride 0.2-0.5%,  
2-bromo-2-nitro-1,3-propylene glycol 0.2-0.5%,  
and water in balance.

Polyethoxyl carboxyl carbamidine is a colorless liquid easily soluble in water. Its aqueous solution is acidic. It has good chemical stability, low volatility and no residue, and is colorless, odorless, nontoxic, non-irritating, stable and biodegradable.

Dodecyl dimethyl benzyl ammonium chloride is a cationic surfactant. It is a colorless or light yellow solid, soluble in ethanol and acetone, and easily soluble in water. Its aqueous solution is alkaline. It has low toxicity,

no residue and good chemical stability (resistant to light, heat and pressure), and is colorless, odorless, non-irritating and biodegradable.

Dodecyl dimethyl benzyl ammonium bromide is a cationic surfactant, which is colorless or light yellow colloid with aromatic smell and very bitter taste. It is easily soluble in water. Its aqueous solution is a colorless odorless transparent alkaline liquid. It has low toxicity, no residue, low volatility and good chemical stability, is non-irritating and biodegradable, and can be stored for a long period of time. It can be used to kill various bacteria and viruses.

Bisoctyl/bisdecyl dimethyl ammonium chloride is a cationic surfactant, which is a light yellow or white transparent liquid and soluble in water. 10% aqueous solution of it (pH is 6-9) is a colorless, odorless transparent liquid with low toxicity, low irritation, low volatility and stable nature.

Tetradecyl/octadecyl dimethyl benzyl ammonium chloride is a cationic surfactant. It is a white or light yellow solid and a viscous liquid after dissolved, with slightly pungent odor of chlorobenzene. It is soluble in water. Its aqueous solution is a weakly acidic, colorless and transparent liquid with slightly bitter almond taste, low toxicity, low residue, low volatility and stable nature, and can be used to kill various bacteria and viruses.

Pure 2-bromo-2-nitro-1,3-propylene glycol is white or light yellow

powder or crystal, and its solution can decompose slowly under alkaline conditions. It is soluble in water, and its aqueous solution is a colorless, tasteless and transparent alkaline liquid with good chemical stability (resistant to light, heat and pressure), moderate toxicity, no irritation, low volatility and high biodegradability.

Polyethoxyl carboxyl carbamidine has strong oxidation, and can make amino acids in protein oxidized and decomposed, thus making peptide strands break and protein lose its function. Its guanidine groups with high activity can make the polymer structure be positively charged and rapidly attracted to the negatively charged cell membrane of bacteria, which inhibits the cell division of a virus and makes the virus lose its reproductive capability. Reverse migration is achieved by oxidation and electrons on the cell surface to cause cell rupture, and the guanidine groups infiltrate in cells to make cytoplasm to degenerate; the polymer forms film on the surface of a bacterial cell to block the respiratory channels of micro-organisms, which makes the micro-organism die from suffocation quickly. In the solution system, polyethoxyl carboxyl carbamidine can inhibit the bacterial enzyme system, particularly dehydrogenase and oxidase, to bring about metabolic disorder, thus achieving the purpose of disinfection.

Dodecyl dimethyl benzyl ammonium chloride, dodecyl dimethyl benzyl

ammonium bromide, tetradecyl/octadecyl dimethyl benzyl ammonium chloride, bisoctyl/bisdecyl dimethyl ammonium chloride and quaternary ammonium salt are cationic surfactants. In a solution system, the positively charged groups ionized are quickly attracted to the negatively charged cell membrane, thereby destroying the bacterial cell surface permeability barriers, and causing cell rupture or death from suffocation. They can also cause protein denaturation and inhibit or destroy the activity of enzymes for biological oxidation, respiratory metabolism and energy production in cells, resulting in the death of micro-organisms and achieving the purpose of disinfection.

2-bromo-2-nitro-1,3-propylene glycol can destroy protein peptide chains to make protein denatured and coagulated, resulting in the death of micro-organisms. It can also invade in bacterial cells and release the water film on the surface of protein to make the compounds containing nitrogen and phosphorus in cells leak, thus interfering and damaging the enzymes of micro-organisms and affecting their metabolism. They can cause lysis by undermining the structure and function of the cell membrane, thus achieving the effect of inhibiting or killing bacteria.

Polyethoxyl carboxyl carbamidine and quaternary ammonium salt have synergistically bactericidal effect. Quaternary ammonium salt can destroy bacterial cell surface permeability barriers so that polyethoxyl carboxyl

carbamidine can enter the inside of cells more easily to carry out oxidation, thus enhancing the bactericidal capacity. Quaternary ammonium salt can have its capability of destroying bacterial cell surface permeability barrier enhanced after being compounded. Quaternary ammonium salt and polyethoxyl carboxyl carbamidine can destroy bacterial cell surface permeability barriers to make alcohol denatured more easily, thus improving disinfection effect. The amount of polyethoxyl carboxyl carbamidine is also reduced by compounding, thereby reducing costs.

### **Beneficial Effects of the Invention**

1. Small dosage and good disinfecting effect: applying the disinfectant of 100 ppm to *Escherichia coli* and *Staphylococcus aureus*, the killing rate can reach 99.99% in 1 min; applying the disinfectant of 50 ppm to *Escherichia coli* and *Staphylococcus aureus*, the killing rate can reach 99.99% in 2 min. Under the same conditions, the comprehensive indexes of the disinfectant are superior to those of glutaraldehyde, chlorine dioxide and peracetic acid.
2. Good safety performance: the various raw materials for preparing the disinfectant are all selected according to relevant standards, and the disinfectant is a colorless, clear and transparent liquid, and its solution is weakly acid, tasteless, odorless, non-irritating, nontoxic and residueless.



The disinfectant is superior to chlorine dioxide, glutaraldehyde and peracetic acid both in the production process and application.

3. Environmental-friendliness, safety and simple operation: the disinfectant is safe to the human body and friendly to the environment both in the production process and application.

### **Example of the Invention**

#### **Example 1**

Polyethoxyl carboxyl carbamidine 0.4 g, dodecyl dimethyl benzyl ammonium chloride 0.2 g, dodecyl dimethyl benzyl ammonium bromide 0.2 g, bisoctyl/bisdecyl dimethyl ammonium chloride 0.3 g, tetradecyl/octadecyl dimethyl benzyl ammonium chloride 0.4 g, 2-bromo-2-nitro-1,3-propylene glycol 0.5 g and water in balance are mixed to obtain a disinfectant of 100 g.